

**REMARKS**

Claims 12-25 are pending in the application. No amendments have been made to the claims. Reconsideration and allowance of the claims are respectfully requested in view of the following remarks.

1. **Rejection of claims 12, 13, 16-20, 24, and 25 under 35 U.S.C. §103(a) as being unpatentable over Shirai (JP 2002-141077), hereafter “Shirai” or “077” in view of Kaneko (JP 06-318736), hereafter “Kaneko” or “736.”**

Claims 12-13, 16-20, and 24-25 stand rejected as obvious over the combination of Shirai in view of Kaneko.

As indicated in the outstanding office action Shirai fails to teach all of the limitations of claims 12 and 18. Thus, Kaneko is relied upon to rectify the deficiencies of Shirai. In particular, the outstanding office action states:

However, Shirai does not expressly teach adjusting a voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source. The Kaneko reference discloses a method of controlling the temperature of a temperature-controlled object by using a Peltier thermoelectric element comprising: a step of passing a current by electrical potential difference in the direction of apart connected to the p-type thermoelectric material from the part connected to the n-type thermoelectric material in order to cool the temperature controlled object; and a step of reversing the direction of the current in order to heat the temperature controlled object (See paragraphs [0016], [0022]). Examiner’s note: It is inherent in the Kaneko reference that a power source is electrically connected to the thermoelectric element. It is also inherent that the heat distribution of the fuel cell assembly will be substantially uniform as a result of heating or cooling the fuel cell stack by using the Peltier device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the Shirai fuel cell stack by include (sic) a step of adjusting a voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the

power source in order to more efficiently utilize the Peltier device to maintain an uniform temperature distribution of the fuel cell stack.

Examiner's note: The Kaneko reference is relevant to the Shirai reference and the applicant's field of endeavor because it solves the same problem of regulating the temperature of a temperature controlled object by using a Peltier device. In addition, the motivation to combine the Kaneko reference with the Shirai reference is found in the knowledge generally available to one of ordinary skill in the art.

(Office Action of 3/20/07, page 2-4).

Applicant greatly appreciates the detailed basis of rejection but must respectfully disagree.

First, Applicant respectfully traverses the statement of the office action that "motivation to combine the Kaneko reference with the Shirai reference is found in the knowledge generally available to one of ordinary skill in the art." (Office Action of 3-20-07, page 6). The ultimate legal conclusion of obviousness must be based on facts or records, not on the Examiner's unsupported allegation that a particular structural modification is "well known" and thus obvious. Subjective opinions are of little weight against contrary evidence. *In re Wagner et al.* 152 U.S.P.Q. 552 (C.C.P.A. 1967). Also, a statement that modifications of the prior art to meet the claimed inventions would have "well within the ordinary skill of the art at the time the claimed invention was made" because the references teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levingood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993); MPEP 2143.01

Furthermore, Kaneko fails to rectify the deficiencies of Shirai. Kaneko is directed to a thin film thermoelectric element namely, a Peltier device that is capable of providing temperature control for large amounts of heat, wherein a thin film Peltier device has at least two or more pieces of the joints between thermoelectric materials, which perform the temperature control function, and the joints are laminated (Kaneko, Abstract). Although Kaneko discloses passing a current by electrical potential difference in the direction of a part connected to the p-type thermoelectric material from the part

connected to the n-type thermoelectric material in order to cool a temperature controlled object, it is completely silent as to measuring the temperature controlled object and adjusting the voltage of a power source in response to said measurement. Nothing in Kaneko teaches or suggests measuring the temperature of a fuel cell assembly in contact with a thermo electric layer; and then adjusting the voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer, wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source and wherein a heat distribution of the fuel cell assembly is substantially uniform. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (C.C.P.A. 1974); MPEP 1243.03.

Upon review of the machine translation of Kaneko, it appears that the Peltier device is placed on the substrate or surface of a functional device (Kaneko, paragraphs [0013] and [0015] and Drawings 1-3). Kaneko further requires that the heat dissipation electrode be in direct contact with the atmosphere (Kaneko, Abstract). “The atmospheric-air touch area of heat dissipation electrode...and an atmospheric natural convection heat transfer serve as an important item in [the] thin film Peltier [thermoelement].” (Kaneko, [0018]). Placing the Kaneko Peltier device inside of Applicant’s fuel cell assembly or fuel cell stack would prevent the heat dissipation electrode from coming in direct contact with the atmosphere; rendering the Kaneko Peltier device inoperable.

In addition, the office action asserts that it is inherent in the Kaneko reference that a power source is electrically connected to the thermoelectric element or that the heat distribution of a temperature controlled object will be substantially uniform as a result of heating or cooling said object by using the Kaneko Peltier device. The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.] *In re Oelrich*, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981). That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown. *In re Spormann*, 150 U.S.P.Q. 449, 452 (C.C.P.A. 1966).

Finally, the Shirai reference teaches away from using the Kaneko Peltier Device and the two references cannot be operably combined to meet Applicant's invention. The Kaneko reference teaches away from placing its Peltier device in a fuel cell or fuel cell stack. As previously stated, the Kaneko Peltier device requires that the heat dissipation electrode be in direct contact with the atmosphere. References that teach away from each other cannot be combined.

Accordingly, (1) the cited combination fails to provide all of the required claim limitations, i.e., measuring the temperature of the fuel cell assembly in contact with a thermoelectric layer and adjusting the voltage of power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer, wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source and wherein a heat distribution of the fuel cell assembly is substantially uniform; (2) the suggested modifications of the prior art inventions would render the prior art inventions inoperable for their intended purpose; (3) the cited references teach away from each other and from Applicant's claimed invention; and (4) the cited references fail to provide a motivation to do what Applicants have done, i.e. measuring the temperature of the fuel cell assembly in contact with a thermoelectric layer and adjusting the voltage of power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer, wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source and wherein a heat distribution of the fuel cell assembly is substantially uniform.

Applicant therefore respectfully submits that the cited combination of Shirai and Kaneko fails to provide a *prima facie* case of obviousness and the combination or modification of Shirai with Kaneko fails to teach or suggest all the limitations of Applicant's independent claims 12 and 18.

Reconsideration and withdrawal of the obviousness rejection with respect to independent claims 12 and 18 is respectfully requested in view of the foregoing amendments and remarks. Claims 13-17 and 19-25 are likewise submitted to be

nonobvious as these claims depend either directly or indirectly from independent claims 12 and 18 and are believed to be allowable for the same reasons as claims 12 and 18.

2. **Rejection of claims 14 and 22 under 35 U.S.C. §103(a) as being unpatentable over Shirai (JP 2002-141077), hereafter “Shirai” or “077” in view of Kaneko (JP 06-318736), hereafter “Kaneko” or “736” as applied to claim 12 and 18 above, and in further view of Doke, U.S. 5,576,512, hereafter “Doke” or “512.”**

Claims 14 and 22 also stand rejected as obvious over the combination of Shirai in view of Kaneko and in further view of Doke.

The outstanding office action acknowledges that Shirai as modified by Kaneko fails to expressly teach a power source that is a battery. Doke is relied upon to rectify this deficiency. As Doke has merely been cited for disclosing a power source that is a battery, nothing in Doke rectifies the deficiencies of the combination Shirai and Kaneko, as discussed above, with respect to independent claims 12 and 18.

Thus, reconsideration and removal of the rejection is respectfully requested since claims 14 and 22 depend from claims 12 and 18 respectively.

3. **Rejection of claims 15 and 23 under 35 U.S.C. §103(a) as being unpatentable over Shirai (JP 2002-141077), hereafter “Shirai” or “077” in view of Kaneko (JP 06-318736), hereafter “Kaneko” or “736” as applied to claim 12 and 18 above, and in further view of Cargnelli, U.S. 5,753,383, hereafter “Cargnelli” or “383.”**

Claims 15 and 23 also stand rejected as obvious over the combination of Shirai in view of Kaneko and in further view of Cargnelli.

The outstanding office action acknowledges that Shirai and Kaneko both fail to expressly teach a power source that is the fuel cell assembly. As Cargnelli has merely been cited for disclosing a power source that is the fuel cell assembly, nothing in Cargnelli rectifies the deficiencies of the combination of Shirai and Kaneko, as discussed above, with respect to independent claims 12 and 18. Thus, reconsideration and removal of the rejection is respectfully requested since claims 15 and 23 depend from claims 12 and 18 respectively.

4. **Rejection of claim 21 under 35 U.S.C. §103(a) as being unpatentable over Shirai (JP 2002-141077), hereafter “Shirai” or “077” in view of Kaneko (JP 06-318736), hereafter “Kaneko” or “736” as applied to claim 12 and 18 above, and in further view of Walsh, U.S. 2003/0044662, hereafter “Walsh” or “662.”**

Claim 21 also stands rejected as obvious over the combination of Shirai in view of Kaneko and in further view of Walsh.

The outstanding office action acknowledges that Shirai and Kaneko both fail to expressly teach temperature devices that are thermocouples. As Walsh has merely been cited for disclosing a temperature device that is a thermocouple, nothing in Walsh rectifies the deficiencies of the combination of Shirai and Kaneko, as discussed above, with respect to independent claim 18.

Thus, reconsideration and removal of the rejection of claim 21 is respectfully requested since claim 21 depends from claim 18.

### **CONCLUSION**

In view of the above remarks, it is respectfully submitted that the present application is in condition for allowance. Such action is most earnestly solicited. If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below for an interview.

If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130, maintained by the applicant's attorney.

Respectfully submitted,

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